REMARKS

The following uses the paragraph numbering of the Office Action.

Paragraph 4

Claims 1-4, 6-12, 14, 16, 21-23 stand rejected under Section 103(a) as being unpatentable over US Patent 6, 304,634 ("Hollier") and in view of US patent 5,940,472 ("Newman").

Consideration of the rejection will require an understanding of the objectives of the present invention as well as the objectives of the cited references. A Section 103(a) rejection can not be substantiated by combining elements from prior patents, unless it can be shown that there was a prior art suggestion supporting such combining (see MPEP Section 2141, and cited authorities).

In the right-hand column of applicant's Fig. 2 there is diagrammed a hypothetical flow of "spoken" messages interchanged between a customer and an automated interactive voice response (IVR) system during the course of one telephone conversation or call. A matter of concern is whether each "spoken" message from the IVR system is the **correct message** in the **correct order**. Thus, an important aspect of "call-flow" verification is the content and order of messages during a call which may, for example, consist of many messages and interchanges .

It is easy to verify the content of one message. It is more difficult to verify the content and order (e.g., the call-flow) of a call involving many messages. As discussed in the present application, it is even more difficult to provide high-volume call-flow verification involving, for example, thousands of calls.

Applicant discloses and claims methods suitable for high-volume call-flow verification. A key aspect of applicant's methods is the use of **coded signals** to represent the content (e.g., the actual **spoken words**) of a message. By representing a spoken message in code, recognition of the words of each received message becomes efficiently automatable.

Alone or together, the cited references fail to disclose or suggest such use of coded signals or any method as claimed.

- Hollier is concerned with **transmission quality** of a transmission path. Hollier is concerned with message content only secondarily, to the extent it affects the ability to evaluate transmission quality.
- To test functional operation of telephone systems, Newman teaches a test configuration which **isolates** the voice transmission path from access by the test system.

The voice path isolation taught by Newman is incompatible with the objectives of Hollier to directly receive and evaluate voice messages.

THE HOLLIER DISCLOSURE

As stated by Hollier: "This invention relates to the **quality assessment** of communications systems." (Col. 1, lines 607; emphasis added.)

In Fig. 1, Hollier shows an "outline structure for a quality assessment (QA) system" with test units positioned with access to the ends of a network to be evaluated. One of the test units 21 and 22 "initiates a conversation" and speaks words or phrases to the other measurement device over a communication link of network 20 whose **quality** of

transmission is to be tested. The objective being "to obtain a comprehensive assessment of the quality of the link as a whole." (Col. 7, lines 28-54.)

As specified by Hollier:

> The key measurement to be made on the network under test is the **quality of conversational speech**. (Col. 5, lines 31-32.)

At column 5, lines 32-50, Hollier provides a listing of "different factors" upon which that "key measurement" depends. These factors address aspects of transmission quality.

In emphasizing use of speech for quality evaluation, Hollier states: "It is therefore advantageous that a system for assessing the quality of such a network for passing speech should use **only** speech or speech-like signals in its tests." (Col. 6, lines 33-35, emphasis added.) Hollier thus specifically teaches away from transmission of coded signals for test purposes.

THE NEWMAN DISCLOSURE

The Newman test system of Fig. 1 consists of controller 100 and call generator 103. Fig. 1 shows a test configuration to enable the test system 100/103 to test operation of Operator Network Center (ONC) 104. (Col. 1, line 65, to col. 2, line 2.) As described, a test call is routed "to the ARU 106 via the voice path line 137." As shown, controller 100 is coupled to ARU 106 of ONC 104 via the "Logrec" test signal line 105, but has **no direct access** to voice path 137.

As described by Hollier, the test units 21 and 22 are located at each end of network 20 under test, to provide **direct access** for speech quality evaluation. In contrast, as taught by Newman test system 100/103 is **isolated** from the actual voice path over which a message is sent.

THE INVENTION

Interactive voice response (IVR) systems are widely used. As such, the satisfaction of a bank's customers may depend on the accuracy of call-flow performance as provided by an IVR system used by the bank, for example. If a customer calls to get current account information and the bank's IVR system provides an inappropriate voice message in response, the customer may become irritated. The bank may lose such irritated customers without knowing why. An efficient way of verifying the actual flow of messages (e.g., "call-flow verification") is thus highly desirable.

As concisely stated in the opening sentence of the application:

> This invention relates to testing of interactive audio systems and, more particularly, to **verification of content and flow** of messages or prompts provided by a voice response system in the course of processing a user call. (Emphasis added.)

Fig. 8 outlines a call-flow verification method. As a simplified example, automatic call generator 16 places calls to interactive voice system 10 which simulate a call a bank customer might place to obtain account information. IVR system 10 provides response messages as it would to a bank customer. In order to permit efficient analysis of response messages to test whether the IVR system 10 is sending incorrect messages to customers, for test purposes the response messages are represented by coded DTMF signals. By use of the coded signals to represent a voice message which would be sent to a customer, computer analysis can be employed to rapidly process the coded signals so that a large volume of test calls can be processed. During testing the actual voice message which would be sent to a customer can be omitted and represented only by the

coded signal. By comparing the coded representation of a voice message (i.e., "utterance") against the content of a correct utterance, call-flow can be verified and call-flow discrepancies identified.

Coded Signals

Pursuant to the invention, call-flow verification is arranged to operate to test operation of interactive audio systems which incorporate a call-flow verification (CFV) mode in which prompt signals are formulated with **inclusion of coded signals** which represent content of utterances.

In one embodiment such prompt signals are **composite** prompt signals which include both an utterance and coded signals framing the utterance (e.g., before and after the voice message). Examples of such composite prompt signals are shown in Fig. 7A as Prompt Signals "A" identified by the bracket on the right side of Fig. 7A. Formatting and content of a composite prompt signal for CFV mode operation are described in greater detail on page 12 of the specification and the particular example of the prompt signals "A" is described at lines 12-24 of page 12. Other forms of prompt signals, such as versions including coded versions of the utterance but excluding the actual audio voice utterance during testing, are also described.

To take advantage of efficiencies in call-flow verification made possible by the provision of utterance content in the form of coded signals in prompt signals, applicant's methods and apparatus provide for comparing utterance content as represented by such coded signals against correct utterance content stored in advance for use in such comparisons. A record of call-flow discrepancies identified in received prompts can be used to enable corrective action to be taken.

Claim Terminology

Terms used in applicant's claims include:

- "prompt signals" – these are signals sent **from** an interactive audio or IVR system;
- "utterance" – this is the voice or audio portion of a prompt signal (e.g., a verbal message);
- "content of utterance" – this may be all or a portion of the actual content or wording of an utterance (e.g., "please enter your account number");
- "coded signals" – a coded representation of all or a portion of utterance content (e.g., "please enter your account number" in coded DTMF format);
- "utterance label" – an utterance may be identified by a shortened representation of the full utterance (e.g., rather than the full utterance "please enter your account number", a shortened or abbreviated form or "label" may be included in coded signals to accurately represent or identify the utterance);
- an interactive voice response (IVR) system is a specific form of the more general "interactive audio system."

CLAIM 1

The rejection of claim 1 is not supported by the references in the following respects.

Step (c)

The Office Action, in the second paragraph on page 3, relies on the assertion that a conversational message of Hollier (e.g., "How good is this line's clarity?"; col. 11, lines 29-30) represents "coded signals". However, the Office Action provides no basis for departing from the ordinary and customary meaning of "coded." The dictionary defines "code" as: "A system of signals used to represent letters or numbers in transmitting messages." (The American Heritage Dictionary, third edition, 1992.) A telephone message receivable by a standard telephone does not meet that definition. Further, no reasonable person, skilled or otherwise, would consider such a message to be a "coded" message within the plain meaning of the word.

The Manual of Patent Examining Procedure (MPEP) Section 2111 states that: "During patent examination, the pending claims must be 'given their broadest reasonable interpretation consistent with the specification'." (Citing authority.) Also, "Claim terms are presumed to have the ordinary and customary meanings attributed to them by those of ordinary skill in the art." (MPEP Section 2111.01 II.)

Hollier represents at least ordinary skill in the art and provides no suggestion that the conversational messages used are "coded." In column 7, beginning at line 65, Hollier states that "each device 21, 22 would speak a predetermined sequence of words or phrases." There is no coding of utterance content, each device 21, 22 operates to simply "speak" an utterance.

As to the MPEP requirement for "interpretation consistent with the specification," with reference to applicant's Fig. 4 the specification states:

> Fig. 4 illustrates prompt signals including coded signals (DTMF signals) for the one-word utterance "one." (Page 10, lines 18-19.)

Fig. 4 clearly shows the inclusion of coded signals in the form of DTMF signals preceding and following the utterance "one."

The terms of step (c) must be given their "ordinary and customary meanings" and "given their broadest reasonable interpretation consistent with the specification" as required by the MPEP. When that is done, it is clear that applicant **does** use coded signals and Hollier **does not** use coded signals. This is confirmed by the above-quoted statement direct from Hollier that the Hollier test system should "**only**" use speech or speech-like signals.

Step (d)

In the Office Action it is specifically acknowledged that it is not possible to cite any teaching by Hollier as to "identifying call-flow discrepancies" as provided in step (d).

What is not addressed in the Office Action is that Hollier provides no suggestion at all as to adding improvements to enable call-flow verification and call-flow discrepancy identification. Hollier is concerned with being able to evaluate transmission quality and makes it clear that the content and flow of messages is merely of secondary significance. Thus, any addition of applicant's call-flow monitoring capabilities to Hollier would add cost and complexity, while providing a capability which is in no way suggested by Hollier.

With particular reference to Newman, as discussed above, in Fig. 1 Newman discloses a test system 100/103 which is **isolated** from the voice path 137 and so does not permit direct access to voice signals as required by Hollier to permit evaluation of

transmission quality (e.g., Hollier teaches that units 21, 22 are directly at the ends of network 20). The Office Action does not discuss how to overcome the incompatibility of the Newman isolated voice path teaching with the direct access to voice path teaching of Hollier. The Office Action also does not disclose how physical aspects of the Newman test configuration could actually be physically combined with the Hollier test setup so as to provide an operable system meeting the limitations of claim 1.

The MPEP, in Section 2141, specifies that to support the *prima facie* showing required for a Section 103(a) rejection: (i) the references "must suggest the desirability and obviousness of making the combination" and (ii) "impermissible hindsight vision afforded by the claimed invention" must be avoided.

In the present case, the references are inadequate to support the required *prima-facie* showing. Other than by reference to applicant's claim 1, the Office Action fails to substantiate any suggestion of desirability or obviousness **by the references**.

The Hollier disclosure, if anything, suggests that call-flow verification is not of interest, in view of capabilities of the Hollier system to readily "repeat" or "respond in some other way" in the case of messages which are "corrupted, or not received at all" (Abstract; col. 3, lines 23-30). Newman also provides no suggestion of desirability or obviousness supporting a combination of the references. Moreover, in view of the incompatibilities of Newman regarding isolation of voice path access, as discussed above, there appears to be no reason or practical way to attempt to combine Hollier and Newman without defeating the objectives of Hollier, except possibly on the basis of "impermissible hindsight vision afforded by the claimed invention." Since that is

precluded by the MPEP, the references are inadequate to support the *prima facie* showing required for a Section 103(a) rejection.

Reconsideration and allowance of claim 1 are requested.

DEPENDENT CLAIMS 2-4 and 6-10

These claims, which would become allowable with allowance of claim 1, include additional distinguishing limitations.

For example, claim 2 includes a limitation requiring "activating the CFV mode by sending the CFV sequence code." In the Abstract and beginning at column 2, line 64, Hollier describes activating a method when a first measurement device "makes a call" and "the devices converse using predetermined speech signals." Making a "call" using conversational speech signals is not equivalent to sending "the CFV sequence code" and Hollier fails to provide any disclosure meeting the claim limitation.

Claim 6 refers to activation by a remotely transmitted CFV mode activation command. Having no CFV mode in which utterance content is represented by coded signals, Hollier discloses nothing similar. Hollier refers to a first measuring device making a "call" to start testing, but discloses nothing about "transmission of a CFV mode activation command" as required by claim 6.

Claim 7 refers to CFV mode activation on a "per call basis" or "a basis covering a plurality of calls." Having no CFV mode in which utterance content is represented by coded signals, Hollier discloses nothing similar.

Claim 8 refers to CFV mode activation by CFV sequence code. Having no CFV mode in which utterance content is represented by coded signals, Hollier discloses nothing similar. Hollier does not suggest that a device speaking an utterance should in

any way use any form of sequence code. A "sequence of sounds" as referred to in the Office Action does not meet the limitations as particularly set out in claim 8.

CLAIM 11

To avoid repetition, the discussion above regarding claim 1 is repeated here by reference. For the reasons given, the combination of Hollier and Newman is inadequate to support the *prima facie* showing required for a section 103(a) rejection.

Reconsideration and allowance of claim 11 are requested.

DEPENDENT CLAIM 12

Claim 12, which would become allowable with allowance of claim 11, includes additional distinguishing limitations.

Claim 12 specifies "activating the CFV mode by sending the CFV sequence code." As discussed above, Hollier does not disclose a CFV mode with utterance content in coded form, or any comparable step.

CLAIM 14

To avoid repetition, the discussion above regarding claim 1 is repeated here by reference. Additionally, the steps of claim 14 include further distinguishing limitations.

As to step (a), there are provided:

> (i) "an IVR system having a selectable CFV mode in which content of utterances responsive to an incoming call is represented by coded signals in prompt signals,"
>
> (ii) "the CFV mode selectable by a CFV sequence code."

Based on the discussion above, while Hollier uses prompt signal utterances in the form of spoken words, Hollier fails to disclose any system using coded signals representing

utterance content and fails to disclose anything meeting these claim limitations. To the contrary, Hollier teaches that "only" speech or speech-like signals should be used.

As to step (c), Hollier fails to disclose activating a CFV mode by sending a CFV sequence code. Hollier teaches away from the use of code and does not use any sequence code to activate anything.

As to step (f), in the Office Action the inadequacy of the Hollier disclosure is specifically acknowledged and, as shown above, the Hollier and Newman teachings are both incompatible and inadequate to support the *prima facie* showing required for a Section 103(a) rejection for the reasons given. In the absence of hindsight, the references fail to suggest the desirability or obviousness of combining their disclosures.

Reconsideration and allowance of claim 14 are requested.

DEPENDENT CLAIM 16

Claim 16 would become allowable with allowance of claim 14.

CLAIM 21

Claim 21 is directed to a call-flow verification apparatus comprising an encoding circuit and an activation circuit as described.

The encoding circuit is arranged "to provide coded signals representative of content of utterances in coded format" (lines 4-5). In view of the discussion above regarding claim 1, it is clear that Hollier teaches nothing about representing utterances in **coded format** by coded signals.

The activation circuit of claim 21 enables activation of the encoding circuit so the coded signals are provided in a form usable for call-flow verification purposes. As acknowledged in the Office Action, Hollier teaches nothing about call-flow verification.

As shown above, with reference to claim 1, the Hollier and Newman disclosures in combination are inadequate to support the *prima facie* showing required for a Section 103(a) rejection.

Reconsideration and allowance of claim 21 are requested.

DEPENDENT CLAIMS 22 AND 23

Claims 22 and 23, which would become allowable with allowance of claim 21, include additional distinguishing limitations.

In the call-flow verification apparatus of claim 22, for example, the activation circuit permits selection of prompt signal format. Both of the selections specified in the claim include coded signals. As established above, Hollier relies upon a "call" using conversational speech signals to initiate testing. In the absence of any teaching on use of coded signals, Hollier fails to provide any disclosure meeting the limitations of claim 22.

Paragraph 5

Claims 5, 13, 15 and 24 stand rejected under Section 103(a) as being unpatentable over Hollier and in view of Newman and further in view of US Patent 6,321,198 ("Hank").

Hank is relied upon as teaching that **caller** speech can be converted to ASCII format. Regardless of the relevance, or lack thereof, of Hank to the use of ASCII characters in applicant's novel **composite prompt signals** (e.g., including message content in coded form to facilitate testing and including or excluding message content in verbal form) the Hank disclosure fails to address the inadequacy of the disclosures of Hollier and Newman which is described at length above.

Applicant is not claiming use of characters in ASCII format in the abstract. Hank adds nothing to Hollier with respect to the absence of teaching on configurations of prompt signals which include utterance content in coded format, as disclosed only by applicant.

Thus, each of claims 5, 13, 15 and 24 is allowable for the reasons discussed above regarding its respective parent claim Reconsideration and allowance are requested.

SUMMARY

Claims 17-20 having been allowed, entry of this amendment and reconsideration of all rejections are requested.

An overarching deficiency of all cited references is that there is no prior disclosure of use of prompt signals which include utterance content in coded format as disclosed and claimed by applicant, or of the resulting benefits provided in the context of efficient, high-speed call flow verification.

Hollier activates a test cycle, to test transmitted quality of conversational speech, by making a "call." Signals transmitted by Hollier for such quality evaluation do not involve coded signals within any ordinary or plain meaning of the word "coded."

As to the acknowledged absence of disclosure by Hollier regarding "call-flow deficiencies," no *prima facie* showing of any suggestion or possible physical implementation of a combination of the disclosures of Hollier and Newman has been provided. Neither Hollier nor Newman provides any such suggestion and the voice path isolation taught by Newman is incompatible with testing as taught by Hollier.

Reconsideration and the additional allowance of claims 1-16 and 21-24 are respectfully requested.

This application is considered to be in condition for allowance, which action is respectfully solicited.

Respectfully submitted,

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